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ABSTRACT

Developmental differences in preschool children's abilities to communicate about basic and subordinate level semantic contrasts were examined in a referential communication situation. Twenty-four three, four, and five-year-old children communicated with children of the same age and adults about pictures' referents. Speakers talked about one picture in each of 24 pairs, 12 of which were basic level contrasts (dog/cat), and 12 of which required subordinate level contrasts (poodle/collie). Results based upon child-listener referent selection indicated (1) a significant effect of age, with four- and five-year-old children selecting more correct referents than did three-year-old children, and (2) a significant category effect, with more basic level referents being selected than subordinate level referents. There was also a significant age by category level interaction in which four- and five-year-old children correctly selected more basic level referents then did the three-year old children. Instructions to label each picture in a contrast prior to communicaton resulted in improvement in four-year-old children's communication of subordinate level contrasts. The labeling and communication strategies used by subjects were shown to be a function of age and subject, experience with the task, and contrast type. The study of the referential use of standard linguistic descriptions for basic level and subordinate level semantic contrasts indicated taxonomic differentiation of concrete objects by the children. (Author/FL)

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Children's Communication of Semantic Contrasts

Traditional approaches to investigations of preschoolers' knowledge of the multiple category membership of objects have shown young children to be unsuccessful at hierarchical classification tasks (Bruner, Olver, & Greenfield, 1966; Inhelder & Piaget, 1968; Vygotsky, 1962) and unable to understand class inclusion relations (Piaget, 1952; Inhelder & Piaget, 1964; Kohnstamm, 1967). Rosch and colleagues (1976) have confirmed the usual findings that children cannot successfully sort superordinate categories of objects, but find that 3, 4, and 5-year-old children sort basic level categories in a mature taxonomic way.

An ethnographic approach offers an alternative method for describing and investigating the taxonomic system of young children. One assumption of this approach is that culturally significant cognitive features of objects and categories must be communicable between persons in one of the standard symbolic systems of the culture, that is, they are probably coded in language (Conklin, 1962; Frake, 1962). The study of the referential use of standard readily elicitable responses may be a beginning point for mapping a cognitive system.

One method by which to investigate the taxonomic system of young children is to set up semantic contrasts, i.e., present a choice between objects which appear to contrast at different levels of a taxonomy and ask the child to describe one of the objects. For example, given a picture of a St. Bernard and a robin, if the investigator pointed to the St. Bernard and asked the child to describe it, the child would most likely say, "dog". However, if the pictures were of a St. Bernard and a dachshund,

the appropriate response might be "St. Bernard" or if the child does not know the subordinate name, something like, "the big dog", indicating that "dog" alone is ambiguous because of the category membership shared by both objects.

Research on children's referential communications skills has examined children's description of several kinds of referent/nonreferent relationships, but no investigations have included descriptions of semantic contrasts based upon the multiple category membership of objects. Glucksberg, Krauss and Higgins (1975) reviewed a number of studies of children's referential descriptions of novel graphic designs. Numerous investigations have required children to communicate about objects which are identical with the exception of one or more easily labeled dimensions, e.g., a red triangle versus a blue triangle (Alvy, 1968; Ford & Olson, 1975; Garmizza & Anisfeld, 1976; Price & Shilkret, 1975; Sonnenschein & Whitehurst, 1980; Tenney & Apthorp, 1978; Whitehurst, 1976; Whitehurst & Merkur, 1977; Whitehurst & Sonnenschein, 1978). Young children's communication deficiencies in these studies are due primarily to an inability to locate the differentiating characteristic of a referent when it is paired with similar nonreferents.

In a study by Saunders (1969) the stimuli reflected the structure of semantic contrasts, but were fictitious animal drawings. In this investigation, subjects were shown two animal pictures, each of which were given two names. The two animals had one name in common (like a basic level name) and one name unique to each animal (like a subordinate level name). There was a greater tendency for kindergarteners than seventh graders to give the common name as the description of an animal even though it was to be

distinguished from the other animal. However, the results of this study are confounded by the fact that the younger children had difficulty in learning the two names for each referent. In fact, the seventh graders did not perform significantly better than chance level.

The taxonomic organization used as a basis for formulating the semantic contrasts to be communicated by the preschoolers in this study was that proposed by Rosch and colleagues (Rosch, 1973; Rosch & Mervis, 1975; Rosch, Mervis, Gray, Johnson & Boyes-Braem, 1976). Rosch et al. proposed that taxonomies of concrete objects include a basic level, e.g., dog, a superordinate level, e.g., animal, and a subordinate level, e.g., St. Bernard. The two levels to be considered in this study are the basic and subordinate levels. According to Rosch et al. (1976), at the basic level, instances of a concept are relatively similar to each other in terms of perceptual attributes and functions and that objects at this level are most easily identified and nameable. At the subordinate level, there is somewhat greater similarity among exemplars than at the basic level but these contrasts are not as easily labeled, e.g., St. Bernard, dachshund, nor are those labels generally acquired early in the vocabulary of young children. When 5-year-olds were asked to name pictures of objects, they used almost exclusively basic level names (Rosch et al., 1976).

In the studies to be reported, children's knowledge of both basic level and subordinate level contrasts was examined to assess the organization of preschoolers' taxonomic system for concrete objects. Each referent was described in the context of a nonreferent from a different basic level category, e.g., St. Bernard (dog), robin (bird), and in the context of a referent from the same basic level category, e.g., St. Bernard (dog), dachshund (dog).

Experiment 1

The objective of the study was to investigate preschoolers' knowledge about the multiple category membership of objects and their use of category knowledge in formulating effective messages for describing basic level and subordinate level semantic contrasts in a communication situation.

Method

Subjects. The subjects were 14 3-year-olds, 14 4-year-olds, and 10 5-year-olds from the same day care center. Mean ages at the three age levels were 3 years, 4 months (range 2-11 to 3-11), 4 years, 4 months (range 3-11 to 4-10), and 5 years, 6 months (range 5-2 to 5-10). Approximately equal numbers of males and females at each age participated in the study. Three female adults participated in the study, one as experimenter, two as adult listeners.

Stimuli. Subjects were to communicate about one picture in each of 24 pairs of pictures. Twelve pairs of pictures were basic level contrasts, e.g., dog/bird; i.e., each picture was easily labeled and all basic level names were known by all subjects on a picture naming pretest. The remaining twelve picture pairs were subordinate level contrasts in which each picture was a member of the same basic level category (St. Bernard/dachshund are both dogs), so that the label, dog, would not be an effective description to identify the referent from the nonreferent. The pictures were selected so that the subordinate terms, e.g., St. Bernard, were not required to be communicative. A discriminating feature, such as size, would be adequate to distinguish the referent from the nonreferent. Items were drawn from 5 superordinate categories: clothing, furniture, vehicles, plants, and animals. Examples of the items used in the study are in Table 1.

Insert Table 1 about here

Procedure. Each subject was paired with a child of the same sex, approximately the same age and from the same classroom. Each subject served as both a speaker and a listener in the communication task.

Subjects were seated on opposite sides of an opaque barrier so that they could see neither each other nor each others' picture pairs. Both the speaker and listener had the same pair of pictures in front of them. The adult experimenter pointed to one of the pictures and told the child, who was the speaker, to tell the listener which picture was the special picture. The listener selected the picture described from each of the picture pairs. The listeners' selections were written down. All speech was tape recorded, and the subjects were instructed to talk with each other and ask questions. Adults also served as listeners and selected referents based on the tape recordings of the children's messages, to attempt to identify the possible source of communication failure, the speakers' messages, or the listeners' referent selections.

Results and Discussion

The performance measure for communication success was the number of correct referents selected by the same age listener. Results based upon the same age listeners' referent selections were submitted to an age (3) by role (2) by contrast type (2) repeated measures analysis of variance for unweighted means. There was a significant effect of age with 5-year-olds selecting more correct referents than 3 and 4-year-olds, F (2, 32) = 14.72, $p < .001$, Means = 8.3, 9.2, and 10.7 for 3, 4, and 5-year-olds, respectively. There was a significant effect of contrast type with more basic level referents being

correctly selected than subordinate level referents, F (1, 32) = 108.1, p < .001, Means = 11.47 for the basic level, 7.03 for the subordinate level. There was also a significant age by contrast type interaction as shown in Table 2. Four and 5-year-olds correctly selected more basic level

Insert Table 2 about here

referents than 3-year-olds, and there was an increase with age in the ability to communicate about the subordinate level referents, F = (2, 32) = 4.14, p < .025. There was no effect of role, i.e., whether the child served first as a listener or a speaker, F (1, 32) = 43, n.s.

Results for adults' referent selections based upon the children's messages showed no age effect which suggested that the age effect found previously for child-child pairs was the effect of the child listener. There was a significant effect of contrast type, using adults' referent selections as the performance measure, with more basic level referents correctly selected than subordinate level referents, F (1, 32) = 121.2, p < .001, Means = 11.05 for the basic level, 7.47 for the subordinate level. There was an age by contrast type interaction as shown in Table 2 (columns 2 and 4), F (2, 32) = 6.82 p < .005. There were no age differences in the ability to communicate about basic level referents, unlike the finding for child listeners. It seems that the child listeners had difficulty selecting referents at the basic level as well as the subordinate level. There was an increase in the ability to communicate about subordinate level referents with age.

One possible predictor of successful communication of subordinate level contrasts might be subjects' knowledge of the appropriate subordinate level names of the objects to be communicated, e.g., robin, cardinal.

The children were shown the objects they had already described and were asked whether or not the subordinate name described the picture, e.g., Is this a robin? Subjects at the three age levels did not differ significantly in their comprehension of the subordinate labels, Means = 20.8, 21.9, and 22.6 for 3, 4, and 5-year-olds, respectively. However, the correlations between their knowledge of the subordinate names and their successful descriptions of the subordinate level referents were low for all ages, .23 for the 3-year-olds, .25 for the 4-year-olds, and .30 for the 5-year-olds.

The findings show that there are developmental differences in the ability to communicate about objects within the same category. Three and 4-year-old subjects who successfully described an object within a basic level contrast were unsuccessful at describing the same object for a subordinate level contrast in the taxonomic hierarchy. Knowledge of the subordinate level name of the object did not predict communication of the subordinate level contrasts. Five-year-old subjects were more effective at describing subordinate level semantic contrasts. What remains to be further investigated is whether or not subjects understand both the implications of the shared category membership of objects for communication and the hierarchical organization of concrete objects.

Experiment II

Since subjects at all age levels in Experiment I had difficulty communicating about the subordinate level contrasts, it was hypothesized that highlighting the fact that each picture in a subordinate level contrast was a member of the same basic level category, therefore making that label ineffective, might enhance subjects' awareness of the subord-

inate level contrast as well as facilitate communication performance. The purpose of Experiment II was to investigate preschoolers' use of their knowledge about the basic level category membership of each object in communicating about subordinate level contrasts. A simple labeling question, "What is this?" was asked about each of the pictures in a pair prior to the speaker's description of the referent. It was predicted that making the shared basic level category membership of the objects salient would influence the speakers to provide other information for the subordinate level contrasts.

Method

Subjects. The subjects were 14 4-year-olds and 10 5-year-olds from the same day care center. Mean ages of the subjects were 4 years, 4 months (range 3-11 to 4-10) and 5 years, 6 months (range 5-1 to 6-1). One-half of the subjects at each age level had participated in Experiment 1. Approximately equal numbers of males and females of each age served as subjects. Three female adults participated in the study, one as the experimenter and two as adult listeners.

Stimuli. The stimuli used were identical to those used in Experiment 1.

Procedure. The procedure was identical to Experiment 1 with the exception of the labeling instruction. Prior to communicating about the referent to be described, the experimenter pointed to each picture in the pair and asked, "What is this?" The experimenter then pointed to the referent to be described and told the speaker to tell the listener which picture was the special picture. The procedure continued as in Experiment 1.

Results and Discussion

Results based upon same age listeners' referent selections were submitted to an age (2) by time of testing (2) by contrast type (2) repeated measures analysis of variance for unweighted means. There were no significant effects of age, or whether or not the subject had participated previously in the communication task, F (1, 20) = 2.12, n.s., F (1, 20) = .62, n.s. There was a significant effect of contrast type with more basic level referents being correctly selected than subordinate level referents, F (1, 20) = 25.84, $p < .001$ as shown in Table 3.

Insert Table 3 about here

There was no significant age by contrast type interaction, F (1, 20) = .95 n.s.). The findings based upon adults' referent selections reflected the findings for child listeners' referent selections with the only significant effect being that of contrast type with more basic level referents being correctly selected than subordinate level referents, F (1, 20) = 14.19, $p < .001$. as shown in Table 3.

The labeling instruction was successful in improving 4-year-olds communication of subordinate level contrasts such that 4 and 5-year-olds did not differ in their success at communication. However, the performance of neither age group was at ceiling for description of the subordinate level contrasts. One possible reason for this was differences in item difficulty. The number of subjects at each age level who missed each of the subordinate level contrasts was found. Three of the subordinate level contrasts were found to be more difficult than the remaining

9 subordinate level contrasts. The contrasts, dress pants/blue jeans, tulips/roses, and cardinal/robin were unsuccessfully described by 33% of the subjects. The remaining subordinate level contrasts were unsuccessfully described on the average by only 8% of the subjects. These three subordinate level contrasts seem to account for the failure to be as successful at communicating subordinate level contrasts as basic level contrasts. The difficulty with these contrasts is most likely a function of the perceptual similarity of the actual pictures used in the task. Both the dress pants and blue jeans were similar in color and had belts. Both tulips and roses were red and differed primarily in their numerosity in the picture and whether or not they were in a pot; features neither of which are inherent in a tulip versus a rose. The cardinal and the robin both shared the red color though to different extents.

While subjects at both age levels did not perform at ceiling in communicating the subordinate level contrasts due to differences in item difficulty, the labeling instruction was successful in improving 4-year-olds' communication of subordinate level contrasts such that 4 and 5-year-olds did not differ in their success at communication. In addition, subjects in Experiment II were more successful at describing the subordinate level contrasts than subjects in Experiment I.

Several questions which need to be considered include whether the communication strategies used by the subjects differ as a function of contrast type, age of subject, or prior experience in the task. To address these questions, the communication protocols of subjects in Experiment II were qualitatively analyzed to identify the types of descriptions used by the children at the different age levels to describe the basic level and subordinate level contrasts.

Two adults coded the descriptions by all the subjects of the basic and subordinate level contrasts from transcripts of the children's communications. Three aspects of the communication situations were analyzed in detail to investigate subjects' awareness of the shared category membership of the objects in the subordinate level contrasts: speakers' descriptions of the pictures following the labeling instructions, speakers' strategies for communicating the contrast types, and the listeners' roles in the communication of the two contrast types.

All utterances were coded for whether a basic or subordinate level label was used, whether a feature was provided which would successfully discriminate the referent from the nonreferent in the contrast, whether the listener asked information seeking questions, e.g. "What color is it?" which if answered correctly would distinguish the referent from the nonreferent, and whether features were provided which did not distinguish between the referent and nonreferent. The percent agreement between the two coders was .93. Differences in the use of these strategies was examined as a function of contrast type and age of subject.

Speakers' labels for the pictures differed as a function of contrast type. While the basic level names were used most frequently to describe the two pictures in each contrast type, they were used less often to label the pictures in the subordinate level contrast, $F(1,20) = 24.40$, $p<.001$. Subjects were more likely to use subordinate level labels or a combination of a subordinate level label and a basic level label when they were labeling subordinate contrasts than basic level contrast, $F(1,20) = 13.66$, $p<.001$, as shown in Table 4.

Insert Table 4 about here

There were no age differences in the labeling strategies for the two contrast types. However, there was an age by experience in the task by contrast type interaction effect, $F(1,20) = 4.16$, $p<.05$. Five-year-olds who had participated in Experiment 1 labeled fewer subordinate level contrasts with basic level labels than 4-year-olds with prior task experience (Means = 7.4 vs. 10.00) which suggested that prior experience facilitated the older subjects' differentiation of the contrasts during initial labeling, while younger subjects seemed not to have profited from previous task exposure.

The descriptions used by subjects to communicate the contrast types differed as a function of age, prior experience with the task, and contrast type. The first type of description to be examined was successful labeling. More 5-year-olds than 4-year-olds used labels to describe the contrasts, $F(1,20) = 4.61$, $p<.05$. Subjects who had not been tested in Experiment 1 were more likely to use labels to describe the referents, $F(1,20) = 6.22$, $p<.02$. Labeling was more likely to be used as a communication strategy for basic level contrasts than subordinate level contrasts, $F(1,20) = 24.25$, $p<.001$ as shown in Table 5.

Insert Table 5 about here

The next communication strategy examined was the use of discriminating features, i.e. a feature which distinguishes the referent from the nonreferent in the contrast. The use of discriminating features to differentiate the referents was a function of age, prior experience with the task and contrast type. There was a significant age by prior experience interaction, $F(1,20) = 7.73$, $p<.01$, in which 4-year-olds who had no prior task experience were more likely to use discriminating features in their messages

than other subjects. There was also a 3-way interaction of age, prior experience, and contrast type, $F(1,20) = 14.39$, $p<.001$. Four-year-olds with prior task experience used more discriminating features to communicate subordinate level contrasts than basic level contrasts. Five-year-olds with no prior task experience used discriminating features to communicate more subordinate level contrasts than basic level contrasts, while 5-year-olds who had been in Experiment 1 used discriminating features to successfully describe the referents in both contrast types. The 5-year-olds who had participated in Experiment 1 did not differentiate their use of the discriminating feature strategy as a function of contrast type as shown in Table 5.

The frequency of listener questions differed as a function of contrast type, $F(1,20) = 4.95$, $p<.05$. Listeners asked more questions about subordinate level contrasts than basic level contrasts (Means = 1.71 *vs.* 1.08) which resulted in more successful referent selections following listener questions for subordinate rather than basic level contrasts, $F(1,20) = 9.25$, $p<.01$, Means = 1.79 vs. .38. There were no age differences nor effects of prior task experience on the frequency of listener questions.

The content analyses of subjects' labels and descriptions of the basic and subordinate level contrasts indicated differences in the use of strategy type as a function of age, contrast type, and prior task experience. Basic level contrasts were more likely to be labeled with basic level labels, and described by basic level labels. Subordinate level contrasts were less likely to be labeled by basic level labels and were more likely to be described by discriminating features, except by 4-year-olds with no prior task experience and 5-year-olds with prior task experience. The

novice 4-year-olds and the 5-year-olds who participated in the first experiment use discriminating features to describe both types of contrasts. These two groups exhibited a lack of matching between contrast type and strategy selection. What needs to be examined is the efficiency of their respective communications, i.e. are subjects giving so much information, that they happen to hit upon discriminating features, or are they selectively giving discriminating feature descriptions for the two contrast types?

The efficiency of communication differed as a function of the age of the subjects. Twenty-nine percent of the 4-year-olds provided just enough information to describe the basic level contrasts (labels) and the subordinate level contrasts (discriminating feature or subordinate label) without providing redundant information. Sixty percent of the 5-year-olds provided efficient messages for the two contrast types. The remaining subjects provided more than one descriptor, label or feature, for both basic and subordinate level contrasts.

General Discussion

Subjects' referent descriptions at three stages of the contrast communication task indicated knowledge of contrast levels: fewer basic level names were used to label the pictures in subordinate contrasts; discriminating features were used to differentiate the referent from the nonreferent in subordinate contrasts, not basic level names; and more listeners asked information seeking questions for the subordinate level contrasts than basic level contrasts.

The indices used suggest that preschoolers are sensitive to the shared category membership of concrete objects, and adjust their object descriptions

to reflect the taxonomic level of the contrast, once the shared category membership at the basic level is made apparent through a labeling instruction. It is not the case that the labeling instruction induces taxonomic awareness artifactually by removing the basic level label as a possible description. Four and 5-year-old subjects continue to use the basic level name in the description of the subordinate level contrasts, in conjunction with discriminating features. The study of the referential use of standard linguistic descriptions for basic level and subordinate level contrasts has provided a quasi naturalistic method by which to investigate the taxonomic system for concrete objects of young children.

REFERENCES

Alvy, K.T. Relation of age to children's egocentric and cooperative communication. Journal of Genetic Psychology, 1968, 112, 275-286.

Bruner, J.S., Olver, R.R., & Greenfield, P.M. Studies in cognitive growth, New York: John Wiley & Sons, Inc., 1966.

Conklin, H.G. Lexicographical treatment of folk taxonomies. International Journal of American Linguistics, 1962, 28, 119-141.

Ford, W. & Olson, D. The elaboration of the noun phrase in children's description of objects. Journal of Experimental Child Psychology, 1975, 19, 371-382.

Frake, C.O. The ethnographic study of human cognitive systems. In: Gladwin, T., & Sturtevant, W.C. (Eds.), Anthropology and human behavior. Washington, D.C.: Anthropological Society of Washington, 1962.

Garmizza, C. & Anisfeld, M. Factors reducing the efficiency of referent communication in children. Merrill-Palmer Quarterly, 1976, 22, 125-136.

Glucksberg, S., Krauss, R.M. & Higgins, E.T. The development of referential communication skills. In: Horowitz, F.D. (Ed.), Review of child development research (volume 4). Chicago: University of Chicago Press, 1975.

Inhelder, B., & Piaget, J. The early growth of logic in the child. New York: W. W. Norton, & Co., Inc. 1964.

Kohnstamm, G. A. Teaching children to solve a Piagetian problem of class inclusion. Gravenhage: Mouton, 1967.

Piaget, J. The child's conception of number. New York: Humanities, 1952.

Price, S. & Shilkret, R.B. An interactionist view of the development of communication efficiency: Referential communication as a function of the interaction of age and task variables. Paper presented at the Fifth Annual Symposium of the Jean Piaget Society, 1975.

Rosch, E.H. On the internal structure of perceptual and semantic categories. In: Moore, T.E. (Ed.), Cognitive development and the acquisition of language New York: Academic Press, 1973.

Rosch, E., & Mervis, C.B. Family resemblances: Studies in the internal structure of categories. Cognitive Psychology, 1975, 7, 573-605.

Rosch, E., Mervis, C.B., Gray, W.D., Johnson, D.M., & Boyes-Braem, P. Basic objects in natural categories. Cognitive Psychology, 1976, 8, 382-439.

Saunders, P.S. An experimental analysis of egocentrism in children's communication. Unpublished doctoral dissertation, Rutgers University, 1969.

Sonnenschein, S. & Whitehurst, G.J. The development of communication: When a bad model makes a good teacher. Journal of Experimental Child Psychology, 1980, 3, 371-390.

Tenney, Y.J. & Apthorp, H. The development of knowledge about distinctive features and referential messages in children. Unpublished manuscript, Harvard University, 1978.

Vygotsky, L.E. Thought and language. Cambridge, Mass.: M.I.T. Press, 1962.

Whitehurst, G.J. The development of communication: Changes with age and modeling. Child Development, 1976, 47, 473-482.

Whitehurst, G.J. & Merkur, A. The development of communication: Modeling and contrast failure. Child Development, 1977, 48, 993-1001.

Whitehurst, G.J. & Sonnenschein, S. The development of communication: Attribute variation leads to contrast failure. Journal of Experimental Child Psychology, 1978, 25, 454-490.

Table 1

The Five Taxonomies Used as Stimuli

Superordinate	Basic Level	Subordinates	
Clothing	shirt	sport shirt	dress shirt
	socks	knee socks	tennis socks
	pants	dress pants	blue jeans
Furniture	chair	armchair	kitchen chair
	lamp	floor lamp	table lamp
	bed	double bed	single bed
Vehicle	car	sports car	sedan
Plant	flower	roses	tulips
	tree	evergreen	maple
	grapes	green grapes	purple grapes
Animal	dog	St. Bernard	dachshund
	bird	robin	cardinal

Table 2

Mean Number of Referents Selected by Age, Listener, and Contrast Level

	Contrast Level			
	Basic		Subordinate	
Age	Child Listener	Adult Listener	Child Listener	Adult Listener
3	10.93 (1.14)	10.79 (1.76)	5.71 (1.77)	6.64 (1.87)
4	11.71 (.61)	11.57 (.76)	6.64 (2.34)	7.21 (1.93)
5	11.90 (.32)	10.70 (1.95)	9.40 (2.01)	9.00 (2.87)

Note. Standard deviations are in parentheses.

Table 3

Mean Number of Referents Selected Following Labeling Instructions by Age, Listener, and Contrast Level

	Contrast Level			
	Basic		Subordinate	
Age	Child Listener	Adult Listener	Child Listener	Adult Listener
4	11.21 (1.48)	11.50 (.85)	9.14 (1.67)	9.92 (1.49)
5	11.20 (.99)	10.70 (1.33)	9.80 (1.48)	9.70 (1.64)

Note. Standard deviations are in parentheses.

Table 4

Mean Number of Contrasts Labeled with Basic Level and Subordinate Level Labels Following Labeling Instructions by Age, Prior Task Experience, and Contrast Level

	Contrast Level			
	Basic		Subordinate	
Age	Basic Level Label	Subordinate Level Label	Basic Level Label	Subordinate Level Label
4				
Previously Tested	11.50	.50	10.00	1.38
Not Previously Tested	11.17	.67	8.67	2.50
5				
Previously Tested	11.40	.20	7.40	1.60
Not Previously Tested	10.20	1.20	9.00	2.40

Table 5

Mean Number of Contrasts Described by Labels and Discriminating Features as a Function of Age, Prior Task Experience and Contrast Level

	Contrast Level			
	Basic		Subordinate	
Age	Label	Discriminating Feature	Label	Discriminating Feature
4				
Previously Tested	6.94	4.88	4.13	7.63
Not Previously Tested	7.58	11.83	5.50	10.33
5				
Previously Tested	6.00	8.60	3.90	6.60
Not Previously Tested	6.50	3.20	4.80	9.00